

Tennessee Pollution Prevention Partnership Success Story

MAHLE

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Compressed Air Changes for Energy Conservation

The Member

MAHLE, Inc. is a member of the German headquartered MAHLE Group, a leading manufacturer of pistons and other engine components. For over 80 years, MAHLE has numbered among the leading international manufacturers of high quality components for the automotive industry. Groundbreaking innovations have made MAHLE a reliable and successful partner to its customers.

In Morristown, MAHLE, Inc. serves leading automotive and diesel piston customers and is the leading producer of power cell modules in North America. Over 1,400 employees are proud of their quality, reliability and delivery to their customers. MAHLE, Inc. is ISO-14001 and TS-19649 certified.

The Story

MAHLE uses electrical air compressors to supply compressed air to manufacturing equipment. In 2001 and 2002 the MAHLE Facilities Department was looking to upgrade several pieces of older equipment to improve operating efficiency. Two seventeen-year-old air compressors were identified as replacement items to increase the volume of compressed air supplied to different plant processes.

In 2001 a local air compressor supplier was consulted to assist in increasing the volume and quality of plant compressed air. After reviewing the types of plant air compressors and the load requirements, the supplier recommended replacing two older 450-horsepower single-stage air compressors with two new 400-horsepower tandem-drive air compressors. The new more efficient air compressors provided more compressed air capacity and used less power than the older air compressors.

The Facilities Department also identified that the compressed air piping could be rerouted to increase efficiency and provide drier air to the plant users. Prior to 2001, the compressed air piping had been routed from the six air compressors to a compressed

air receiver tank, then to four air dryers, and finally to the plant processes. The compressed air supply was limited to the output of the operating air dryers. In December 2001, the air piping was rerouted from groups of air compressors to designated air dryers and then to the air receiver tank. This provided a large surge volume of dry compressed air to the plant processes and enabled the Facilities Department to shut down two of the six air compressors during normal operations. The output discharge of the dryers was also re-plumbed to prevent back-feed between dryer stages and resulted in an operating efficiency improvement of 60%.

In June 2003, a compressor staging control system was installed to bring smaller air compressors on line as flow demand increased and to serve as a pressure boost. This allowed only three air compressors to run during normal operations.

The Success

The replacement of two air compressors in 2001 resulted in a direct power savings of 100 horsepower. The improved air compressor efficiency resulted in annual savings of 1,680,000 kilowatt hours and \$67,000 for MAHLE, Inc.

The air piping changes resulted in a direct power savings of 400 horsepower. The improved process efficiency resulted in annual savings of 3,200,000 kilowatt hours and cost savings of \$128,000. The air dryer piping changes resulted in annual savings of 800,000 kilowatt hours and \$32,000.

The Pollution Prevented

This project provided significant environmental improvement by reducing the consumption of non-renewable resources at the power plant. The compressed air improvements resulted in 5.68 million kilowatt hours of electricity savings per year for the company.

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